Government Engineering College

Sec-28 Gandhinagar

Sem:-V (Computer Engineering Department)

Subject: Python with Data Science [3150713]

Name :- Italiya Nirajkumar Vijaybhai

Er .no. : - 190130107041

PDS Assignment

7	**Develop chat room applications using multithreading.(Assignment)**	Co1			
9	**Implement classical ciphers using python. .(Assignment)**	CO1			
10	**Draw graphics using Turtle. .(Assignment)**	CO1			
11	**Develop a program to learn GUI programming using Tkinter. .(Assignment)**	CO1			

Develop chat room applications using multithreading.(Assignment)

Setup Server

```
import time, socket, sys
print('Setup Server...')
print(" Er. no. ",190130107041)
print("Italita NirajKumar \n")
time.sleep(1)
#Get the hostname, IP Address from socket and set Port
soc = socket.socket()
host_name = socket.gethostname()
ip = socket.gethostbyname(host_name)
port = 1234
soc.bind((host_name, port))
print(host_name, '({})'.format(ip))
name = input('Enter name: ')
soc.listen(1) #Try to locate using socket
print('Waiting for incoming connections...')
connection, addr = soc.accept()
print("Received connection from ", addr[0], "(", addr[1], ")\n")
print('Connection Established. Connected From: {}, ({})'.format(addr[0],
addr[0]))
#get a connection from client side
client_name = connection.recv(1024)
client_name = client_name.decode()
print(client_name + ' has connected.')
print('Press [bye] to leave the chat room')
connection.send(name.encode())
while True:
    message = input('Me > ')
    if message == '[bye]':
        message = 'Good Night...'
    connection.send(message.encode())
    print("\n")
    break
    connection.send(message.encode())
    message = connection.recv(1024)
    message = message.decode()
print(client_name, '>', message)
```

output: -

```
import time, socket, sys
print('Setup Server...')
print(" Er. no. ",190130107041)
print("Italita NirajKumar \n")
time.sleep(1)
#Get the hostname, IP Address from socket and set Port
soc = socket.socket()
host_name = socket.gethostname()
ip = socket.gethostbyname(host_name)
port = 1234
soc.bind((host_name, port))
print(host_name, '({})'.format(ip))
name = input('Enter name: ')
soc.listen(1) #Try to locate using socket
print('Waiting for incoming connections...')
connection, addr = soc.accept()
print("Received connection from ", addr[0], "(", addr[1], ")\n")
print('Connection Established. Connected From: {}, ({})'.format(addr[0], addr[0]))
#get a connection from client side
client_name = connection.recv(1024)
client_name = client_name.decode()
print(client_name + ' has connected.')
print('Press [bye] to leave the chat room')
connection.send(name.encode())
while True:
    message = input('Me > ')
    if message == '[bye]':
        message = 'Good Night...'
    connection.send(message.encode())
    print("\n")
    break
    connection.send(message.encode())
    message = connection.recv(1024)
    message = message.decode()
print(client_name, '>', message)
```

```
Setup Server...
 Er. no.  190130107041
Italita NirajKumar

DESKTOP-I2Q19NM (192.168.100.6)
Enter name: Niraj
Waiting for incoming connections...
Received connection from  192.168.100.6 ( 63455 )

Connection Established. Connected From: 192.168.100.6, (192.168.100.6)
Niraj has connected.
Press [bye] to leave the chat room
Me > hi, mem I am Niraj Italiya.


Niraj > hi, mem I am Niraj Italiya.
```

Client Server.

```
 import time, socket, sys
print('Client Server...')
time.sleep(1)
#Get the hostname, IP Address from socket and set Port
soc = socket.socket()
shost = socket.gethostname()
ip = socket.gethostbyname(shost)
#get information to connect with the server
print(shost, '({})'.format(ip))
server_host = input('Enter server\'s IP address:')
name = input('Enter Client\'s name: ')
port = 1234
print('Trying to connect to the server: {}, ({})'.format(server_host, port))
time.sleep(1)
soc.connect((server_host, port))
print("Connected...\n")
soc.send(name.encode())
server_name = soc.recv(1024)
server_name = server_name.decode()
print('{} has joined...'.format(server_name))
print('Enter [bye] to exit.')
while True:
    message = soc.recv(1024)
    message = message.decode()
    print(server_name, ">", message)
    message = input(str("Me > "))
    if message == "[bye]":
        message = "Leaving the Chat room"
        soc.send(message.encode())
        print("\n")
    break
```

output: -

```
import time, socket, sys
print('Client Server...')
time.sleep(1)
#Get the hostname, IP Address from socket and set Port
soc = socket.socket()
shost = socket.gethostname()
ip = socket.gethostbyname(shost)
#get information to connect with the server
print(shost, '({})'.format(ip))
server_host = input('Enter server\'s IP address:')
name = input('Enter Client\'s name: ')
port = 1234
print('Trying to connect to the server: {}, ({})'.format(server_host, port))
time.sleep(1)
soc.connect((server_host, port))
print("Connected...\n")
soc.send(name.encode())
server_name = soc.recv(1024)
server_name = server_name.decode()
print('{} has joined...'.format(server_name))
print('Enter [bye] to exit.')
while True:
    message = soc.recv(1024)
    message = message.decode()
    print(server_name, ">", message)
    message = input(str("Me > "))
    if message == "[bye]":
        message = "Leaving the Chat room"
        soc.send(message.encode())
        print("\n")
    break
```

```
Client Server...
DESKTOP-I2Q19NM (192.168.100.6)
Enter server's IP address:192.168.100.6
Enter Client's name: Niraj
Trying to connect to the server: 192.168.100.6, (1234)
Connected...

Niraj has joined...
Enter [bye] to exit.
Niraj > hi, mem I am Niraj Italiya.
Me > ok,nice How Are You
```

Implement classical ciphers using python

```
plaintext = input("Please enter your plaintext: ")
shift = input("Please enter your key: ")
alphabet = "abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ"
ciphertext = ""


while isinstance(int(shift), int) == False:
  shift = input("Please enter your key (integers only!): ")

shift = int(shift)

new_ind = 0

for i in plaintext:
  if i.lower() in alphabet:
    new_ind = alphabet.index(i) + shift
    ciphertext += alphabet[new_ind % 26]
  else:
    ciphertext += i
print("The ciphertext is: " + ciphertext)
```

output: -

```
print(" Er. no. ",190130107041)
print("Italita NirajKumar \n")
plaintext = input("Please enter your plaintext: ")
shift = input("Please enter your key: ")
alphabet = "abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ"
ciphertext = ""


while isinstance(int(shift), int) == False:
  shift = input("Please enter your key (integers only!): ")

shift = int(shift)

new_ind = 0

for i in plaintext:
  if i.lower() in alphabet:
    new_ind = alphabet.index(i) + shift
    ciphertext += alphabet[new_ind % 26]
  else:
    ciphertext += i
print("The ciphertext is: " + ciphertext)
```

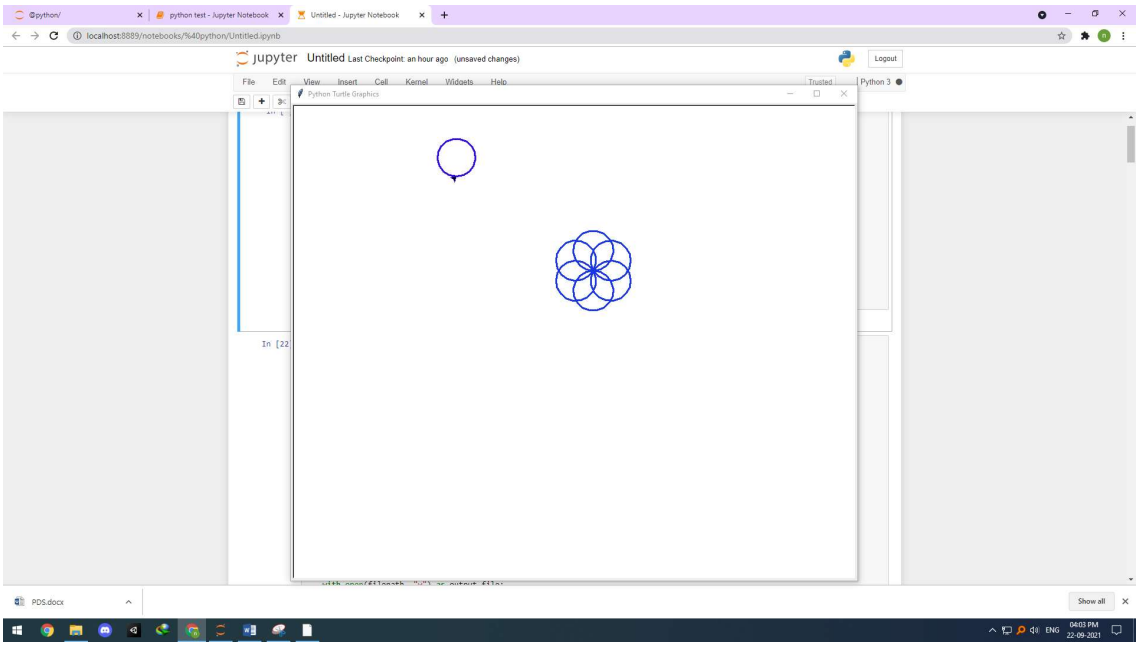
```
 Er. no.  190130107041
Italita NirajKumar

Please enter your plaintext: niraj italiya
Please enter your key: 5
The ciphertext is: snwfo nyfqndf
```

Draw graphics using Turtle. .(Assignment)

Input : -

```
from turtle import *
import random

print(190130107041)
for n in range(60):
    penup()
    goto(random.randint(-400, 400), random.randint(-400, 400))
    pendown()

    red_amount   = random.randint( 0,  30) / 100.0
    blue_amount  = random.randint(50, 100) / 100.0
    green_amount = random.randint( 0,  30) / 100.0
    pencolor((red_amount, green_amount, blue_amount))

    circle_size = random.randint(10, 40)
    pensize(random.randint(1, 5))

    for i in range(6):
        circle(circle_size)
        left(60)
```

output :-



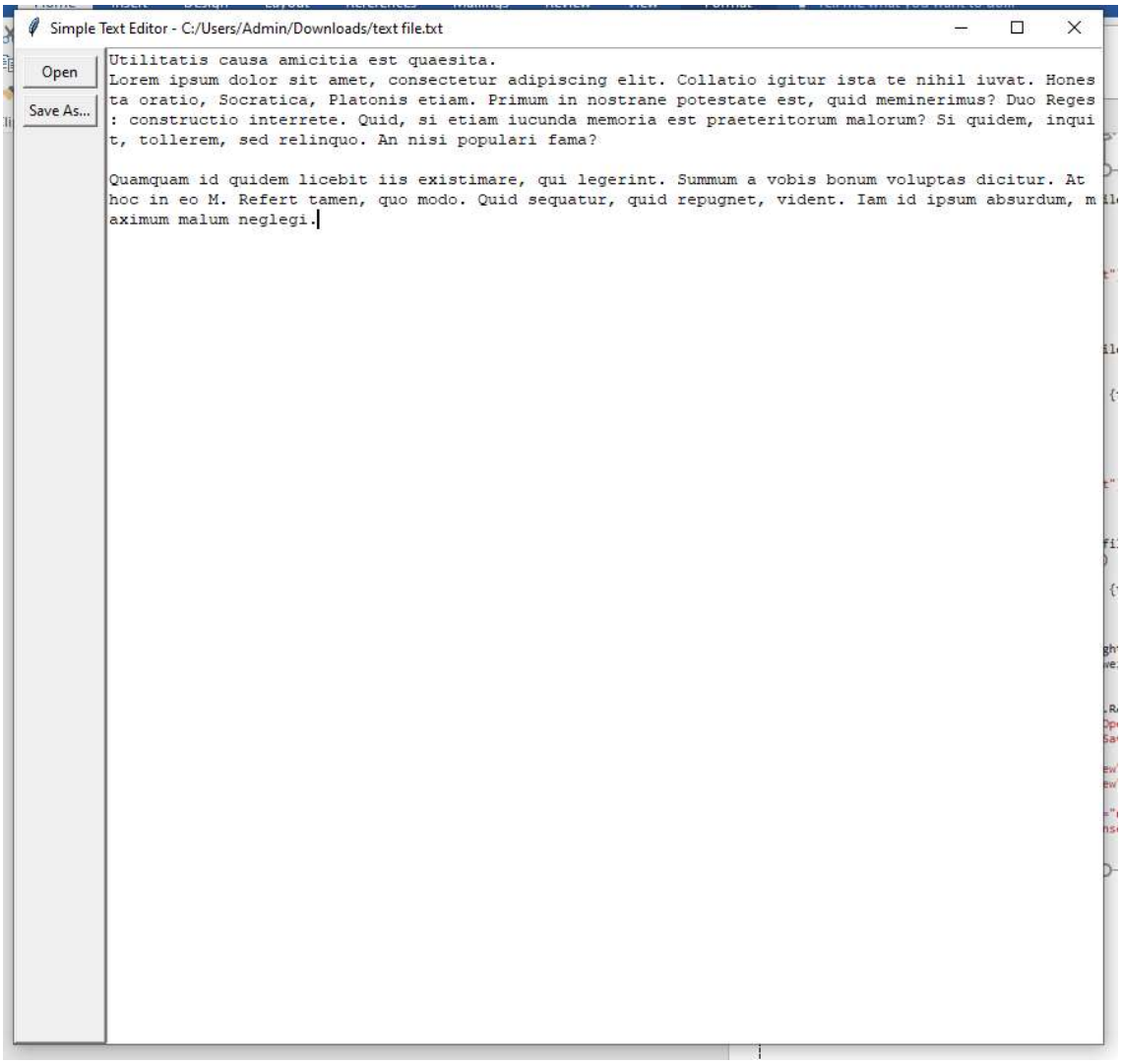
(Video this link assignment :-
https://github.com/Nirajltaliya/sem-5/raw/main/Untitled.mp4
)
Plz. Copy this link Past chorm

Develop a program to learn GUI programming using Tkinter.

1) Text Editer

```
import tkinter as tk
from tkinter.filedialog import askopenfilename, asksaveasfilename

def open_file():

    filepath = askopenfilename(
        filetypes=[("Text Files", "*.txt"), ("All Files", "*.*")]
    )
    if not filepath:
        return
    txt_edit.delete(1.0, tk.END)
    with open(filepath, "r") as input_file:
        text = input_file.read()
        txt_edit.insert(tk.END, text)
    window.title(f"Simple Text Editor - {filepath}")

def save_file():

    filepath = asksaveasfilename(
        defaultextension="txt",
        filetypes=[("Text Files", "*.txt"), ("All Files", "*.*")],
    )
    if not filepath:
        return
    with open(filepath, "w") as output_file:
        text = txt_edit.get(1.0, tk.END)
        output_file.write(text)
    window.title(f"Simple Text Editor - {filepath}")

window = tk.Tk()
window.title("Simple Text Editor")
window.rowconfigure(0, minsize=800, weight=1)
window.columnconfigure(1, minsize=800, weight=1)

txt_edit = tk.Text(window)
fr_buttons = tk.Frame(window, relief=tk.RAISED, bd=2)
btn_open = tk.Button(fr_buttons, text="Open", command=open_file)
btn_save = tk.Button(fr_buttons, text="Save As...", command=save_file)

btn_open.grid(row=0, column=0, sticky="ew", padx=5, pady=5)
btn_save.grid(row=1, column=0, sticky="ew", padx=5)

fr_buttons.grid(row=0, column=0, sticky="ns")
txt_edit.grid(row=0, column=1, sticky="nsew")

window.mainloop()
```

```python
import tkinter as tk
from tkinter.filedialog import askopenfilename, asksaveasfilename

def open_file():

    filepath = askopenfilename(
        filetypes=[("Text Files", "*.txt"), ("All Files", "*.*")]
    )
    if not filepath:
        return
    txt_edit.delete(1.0, tk.END)
    with open(filepath, "r") as input_file:
        text = input_file.read()
        txt_edit.insert(tk.END, text)
    window.title(f"Simple Text Editor - {filepath}")

def save_file():

    filepath = asksaveasfilename(
        defaultextension="txt",
        filetypes=[("Text Files", "*.txt"), ("All Files", "*.*")],
    )
    if not filepath:
        return
    with open(filepath, "w") as output_file:
        text = txt_edit.get(1.0, tk.END)
        output_file.write(text)
    window.title(f"Simple Text Editor - {filepath}")

window = tk.Tk()
window.title("Simple Text Editor")
window.rowconfigure(0, minsize=800, weight=1)
window.columnconfigure(1, minsize=800, weight=1)

txt_edit = tk.Text(window)
fr_buttons = tk.Frame(window, relief=tk.RAISED, bd=2)
btn_open = tk.Button(fr_buttons, text="Open", command=open_file)
btn_save = tk.Button(fr_buttons, text="Save As...", command=save_file)

btn_open.grid(row=0, column=0, sticky="ew", padx=5, pady=5)
btn_save.grid(row=1, column=0, sticky="ew", padx=5)

fr_buttons.grid(row=0, column=0, sticky="ns")
txt_edit.grid(row=0, column=1, sticky="nsew")

window.mainloop()
```



(This practicle Viedo Link :- https://github.com/NirajItaliya/sem-5/raw/main/Note%20Pad.mp4)

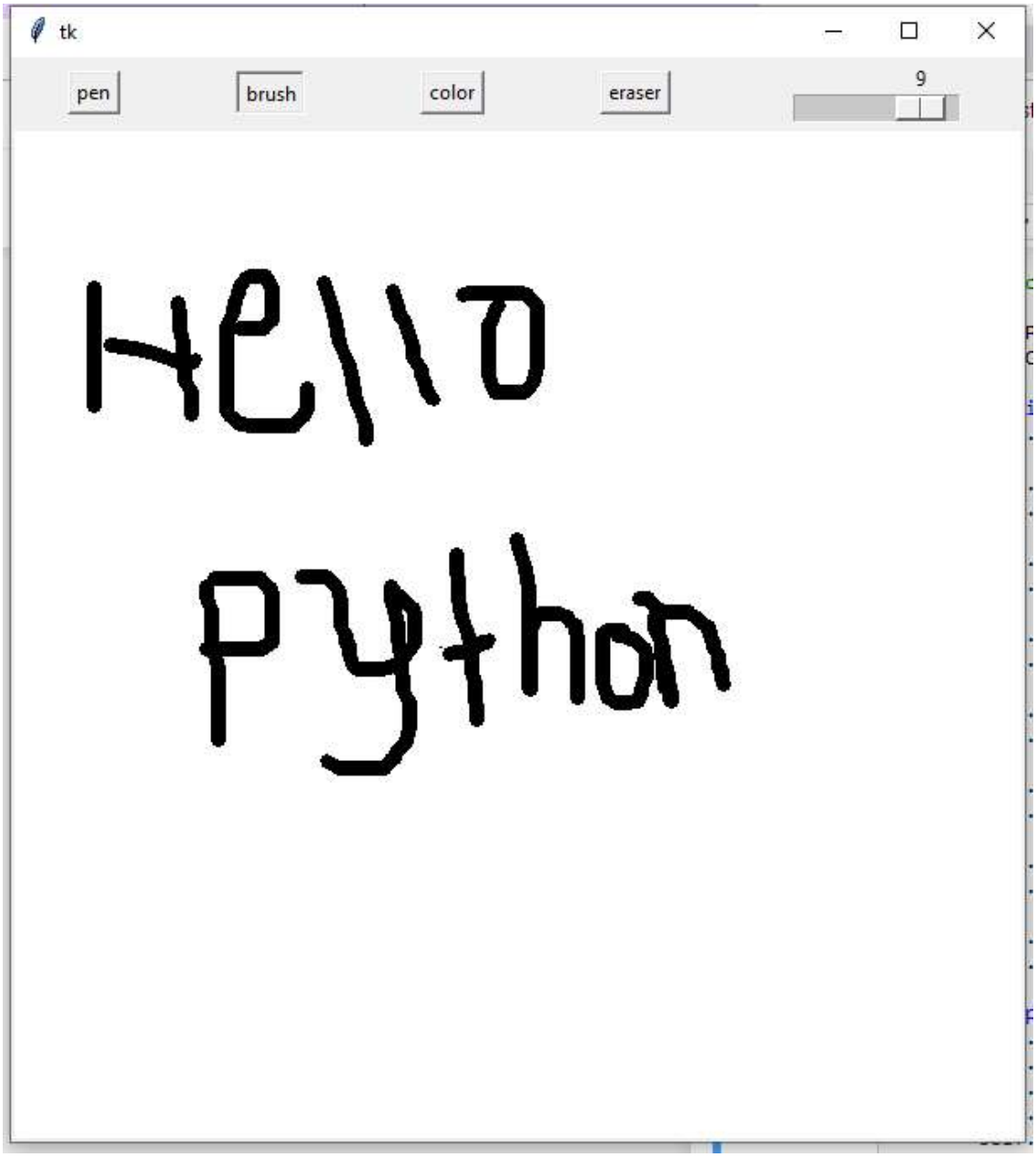
2) Paint

```
# paint

from tkinter import *
from tkinter.colorchooser import askcolor


class Paint(object):

    DEFAULT_PEN_SIZE = 5.0
    DEFAULT_COLOR = 'black'

    def __init__(self):
        self.root = Tk()

        self.pen_button = Button(self.root, text='pen',
command=self.use_pen)
        self.pen_button.grid(row=0, column=0)

        self.brush_button = Button(self.root, text='brush',
command=self.use_brush)
        self.brush_button.grid(row=0, column=1)

        self.color_button = Button(self.root, text='color',
command=self.choose_color)
        self.color_button.grid(row=0, column=2)

        self.eraser_button = Button(self.root, text='eraser',
command=self.use_eraser)
        self.eraser_button.grid(row=0, column=3)

        self.choose_size_button = Scale(self.root, from_=1, to=10,
orient=HORIZONTAL)
        self.choose_size_button.grid(row=0, column=4)

        self.c = Canvas(self.root, bg='white', width=600, height=600)
        self.c.grid(row=1, columnspan=5)
```

```
        self.setup()
        self.root.mainloop()

    def setup(self):
        self.old_x = None
        self.old_y = None
        self.line_width = self.choose_size_button.get()
        self.color = self.DEFAULT_COLOR
        self.eraser_on = False
        self.active_button = self.pen_button
        self.c.bind('<B1-Motion>', self.paint)
        self.c.bind('<ButtonRelease-1>', self.reset)

    def use_pen(self):
        self.activate_button(self.pen_button)

    def use_brush(self):
        self.activate_button(self.brush_button)

    def choose_color(self):
        self.eraser_on = False
        self.color = askcolor(color=self.color)[1]

    def use_eraser(self):
        self.activate_button(self.eraser_button, eraser_mode=True)

    def activate_button(self, some_button, eraser_mode=False):
        self.active_button.config(relief=RAISED)
        some_button.config(relief=SUNKEN)
        self.active_button = some_button
        self.eraser_on = eraser_mode

    def paint(self, event):
        self.line_width = self.choose_size_button.get()
        paint_color = 'white' if self.eraser_on else self.color
        if self.old_x and self.old_y:
            self.c.create_line(self.old_x, self.old_y, event.x, event.y,
                               width=self.line_width, fill=paint_color,
                               capstyle=ROUND, smooth=TRUE,
splinesteps=36)
```

```
        self.old_x = event.x
        self.old_y = event.y

    def reset(self, event):
        self.old_x, self.old_y = None, None


if __name__ == '__main__':
    Paint()
```

Output:-


tk
pen
brush
color
eraser
9
Hello
python

3) Photoediter

```
from tkinter import *
from tkinter import ttk
from tkinter import filedialog
from tkinter.filedialog import askopenfilename,asksaveasfilename
from PIL import Image, ImageTk, ImageFilter, ImageEnhance, ImageOps
import os
# contrast border thumbnail
root = Tk()
root.title("Simple Photo Editor")
root.geometry("640x640")
# create functions
def selected():
    global img_path, img
    img_path = filedialog.askopenfilename(initialdir=os.getcwd())
    img = Image.open(img_path)
    img.thumbnail((350, 350))
    #imgg = img.filter(ImageFilter.BoxBlur(0))
    img1 = ImageTk.PhotoImage(img)
    canvas2.create_image(300, 210, image=img1)
    canvas2.image=img1
def blur(event):
    global img_path, img1, imgg
    for m in range(0, v1.get()+1):
            img = Image.open(img_path)
            img.thumbnail((350, 350))
            imgg = img.filter(ImageFilter.BoxBlur(m))
            img1 = ImageTk.PhotoImage(imgg)
            canvas2.create_image(300, 210, image=img1)
            canvas2.image=img1
def brightness(event):
```

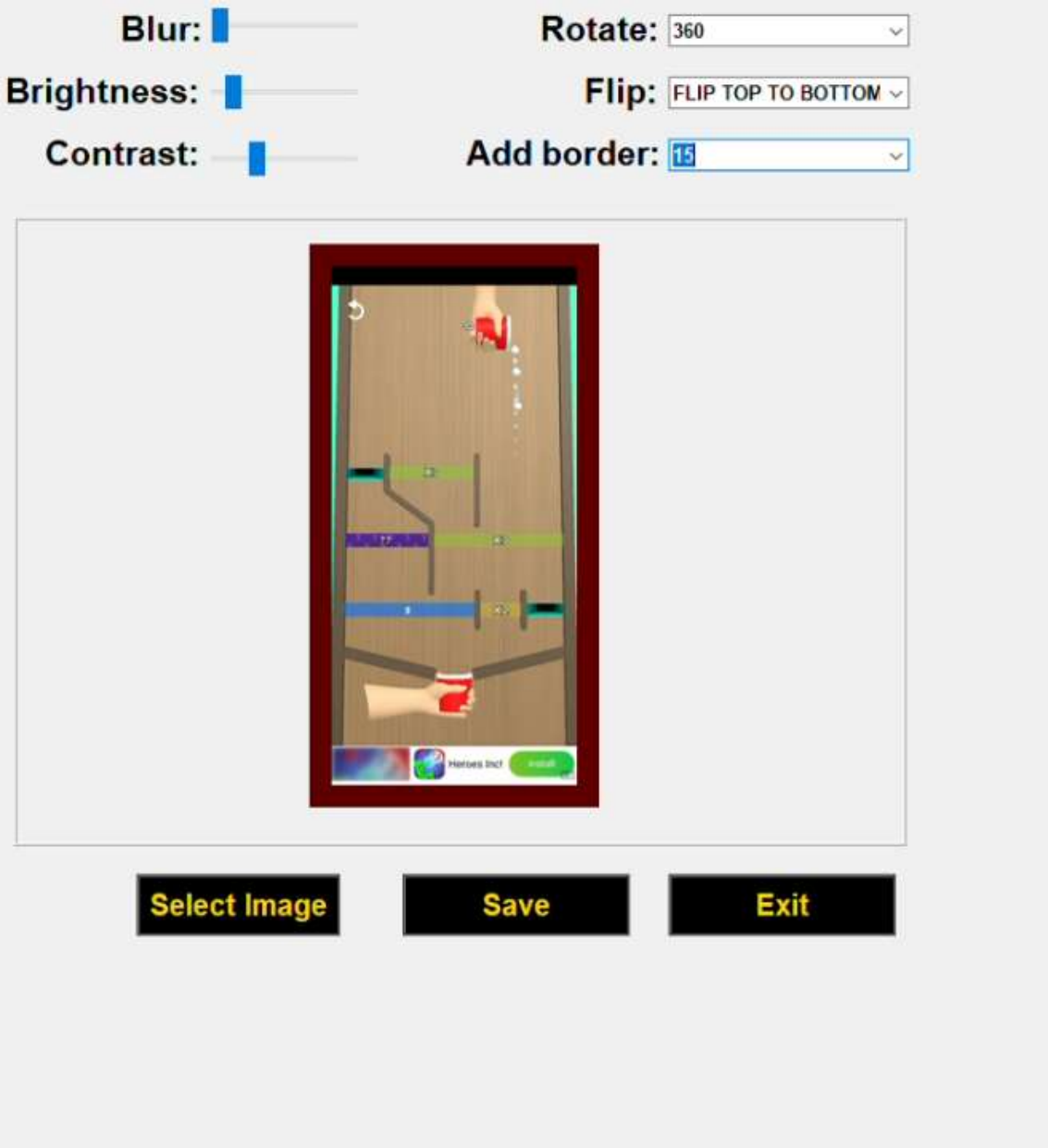
```
    global img_path, img2, img3
    for m in range(0, v2.get()+1):
        img = Image.open(img_path)
        img.thumbnail((350, 350))
        imgg = ImageEnhance.Brightness(img)
        img2 = imgg.enhance(m)
        img3 = ImageTk.PhotoImage(img2)
        canvas2.create_image(300, 210, image=img3)
        canvas2.image=img3
def contrast(event):
    global img_path, img4, img5
    for m in range(0, v3.get()+1):
        img = Image.open(img_path)
        img.thumbnail((350, 350))
        imgg = ImageEnhance.Contrast(img)
        img4 = imgg.enhance(m)
        img5 = ImageTk.PhotoImage(img4)
        canvas2.create_image(300, 210, image=img5)
        canvas2.image=img5
def rotate_image(event):
    global img_path, img6, img7
    img = Image.open(img_path)
    img.thumbnail((350, 350))
    img6 = img.rotate(int(rotate_combo.get()))
    img7 = ImageTk.PhotoImage(img6)
    canvas2.create_image(300, 210, image=img7)
    canvas2.image=img7

def flip_image(event):
    global img_path, img8, img9
    img = Image.open(img_path)
    img.thumbnail((350, 350))
```

```
        if flip_combo.get() == "FLIP LEFT TO RIGHT":
            img8 = img.transpose(Image.FLIP_LEFT_RIGHT)
        elif flip_combo.get() == "FLIP TOP TO BOTTOM":
            img8 = img.transpose(Image.FLIP_TOP_BOTTOM)
        img9 = ImageTk.PhotoImage(img8)
        canvas2.create_image(300, 210, image=img9)
        canvas2.image=img9
def image_border(event):
    global img_path, img10, img11
    img = Image.open(img_path)
    img.thumbnail((350, 350))
    img10 = ImageOps.expand(img, border=int(border_combo.get()), fill=95)
    img11 = ImageTk.PhotoImage(img10)
    canvas2.create_image(300, 210, image=img11)
    canvas2.image=img11
img1 = None
img3 = None
img5 = None
img7 = None
img9 = None
img11 = None
def save():
    global img_path, imgg, img1, img2, img3, img4, img5, img6, img7, img8, img9, img10,
img11
    #file=None
    ext = img_path.split(".")[-1]
    file=asksaveasfilename(defaultextension =f".{ext}",filetypes=[("All Files","*.*"),("PNG
file","*.png"),("jpg file","*.jpg")])
    if file:
        if canvas2.image==img1:
            imgg.save(file)
        elif canvas2.image==img3:
            img2.save(file)
```

```
        elif canvas2.image==img5:
            img4.save(file)
        elif canvas2.image==img7:
            img6.save(file)
        elif canvas2.image==img9:
            img8.save(file)
        elif canvas2.image==img11:
            img10.save(file)
# create labels, scales and comboboxes
blurr = Label(root, text="Blur:", font=("ariel 17 bold"), width=9, anchor='e')
blurr.place(x=15, y=8)
v1 = IntVar()
scale1 = ttk.Scale(root, from_=0, to=10, variable=v1, orient=HORIZONTAL, command=blur)
scale1.place(x=150, y=10)
bright = Label(root, text="Brightness:", font=("ariel 17 bold"))
bright.place(x=8, y=50)
v2 = IntVar()
scale2 = ttk.Scale(root, from_=0, to=10, variable=v2, orient=HORIZONTAL,
command=brightness)
scale2.place(x=150, y=55)
contrast = Label(root, text="Contrast:", font=("ariel 17 bold"))
contrast.place(x=35, y=92)
v3 = IntVar()
scale3 = ttk.Scale(root, from_=0, to=10, variable=v3, orient=HORIZONTAL,
command=contrast)
scale3.place(x=150, y=100)
rotate = Label(root, text="Rotate:", font=("ariel 17 bold"))
rotate.place(x=370, y=8)
values = [0, 90, 180, 270, 360]
rotate_combo = ttk.Combobox(root, values=values, font=('ariel 10 bold'))
rotate_combo.place(x=460, y=15)
rotate_combo.bind("<<ComboboxSelected>>", rotate_image)
flip = Label(root, text="Flip:", font=("ariel 17 bold"))
```

```
flip.place(x=400, y=50)

values1 = ["FLIP LEFT TO RIGHT", "FLIP TOP TO BOTTOM"]

flip_combo = ttk.Combobox(root, values=values1, font=('ariel 10 bold'))

flip_combo.place(x=460, y=57)

flip_combo.bind("<<ComboboxSelected>>", flip_image)

border = Label(root, text="Add border:", font=("ariel 17 bold"))

border.place(x=320, y=92)

values2 = [i for i in range(10, 45, 5)]

border_combo = ttk.Combobox(root, values=values2, font=("ariel 10 bold"))

border_combo.place(x=460, y=99)

border_combo.bind("<<ComboboxSelected>>", image_border)

# create canvas to display image

canvas2 = Canvas(root, width="600", height="420", relief=RIDGE, bd=2)

canvas2.place(x=15, y=150)

# create buttons

btn1 = Button(root, text="Select Image", bg='black', fg='gold', font=('ariel 15 bold'),
relief=GROOVE, command=selected)

btn1.place(x=100, y=595)

btn2 = Button(root, text="Save", width=12, bg='black', fg='gold', font=('ariel 15 bold'),
relief=GROOVE, command=save)

btn2.place(x=280, y=595)

btn3 = Button(root, text="Exit", width=12, bg='black', fg='gold', font=('ariel 15 bold'),
relief=GROOVE, command=root.destroy)

btn3.place(x=460, y=595)

root.mainloop()
```

output :-



(This practicle Viedo Link :- https://github.com/NirajItaliya/sem-5/raw/main/Paint.mp4)